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Five speeches presented at the 41st annual meeting of the National Council on Schoolhouse Construction, October 1964. Of particular interest are the results of a survey of 390 graduate schools, colleges or departments of education seeking information on the courses offered and scope of training given school plant planning specialists. (FPO)

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**THE ROLE AND TRAINING OF THE
SCHOOL PLANT SPECIALIST**

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THE ROLE AND TRAINING OF THE SCHOOL PLANT SPECIALIST

WILLIAM W. CHASE

Before calling upon the panel members, I should like to make a few comments which will, hopefully, set the stage.

As the previous speakers have indicated, loss of schools by fire and other causes will continue, population shifts and urban renewal will cause abandonment of some and the need for new facilities. Limited access highways are creating problems with respect to location and size of present and future school centers. The extension of the school year to include kindergarten, nursery, junior college, and adult education programs (including retraining); new concepts of teaching; and the learning process are making many buildings obsolete, thus adding to the need for new facilities.

Estimated expenditures for elementary, secondary, and higher education have increased from a total of \$31.0 billion in 1962-63 to a total of \$33.7 billion in 1963-64. Of these amounts, it is estimated that \$5 billion was spent for capital outlay in 1962-63 and \$5.3 billion in 1963-64.

Obviously, the impact of these ever-growing enrollments and expenditures for educational facilities points out the increasing need for and importance of the educational building consultant. If he is to keep abreast of classroom needs the consultant must, of necessity, become an integral part of the educational process. He must possess administrative skills, knowledge of recent technology, research abilities, and business acumen to fulfill his many responsibilities.

He has the overall responsibility for coordinating various aspects of the local school district facilities planning program. The nature and/or amount of his direct participation will be largely dependent upon whether he is (1) a regular member of the local staff specifically assigned to this task and accountable to the board of education directly or through the superintendent; (2) a member of a university staff; (3) a member of the school planning division of the State department of education; (4) an independent private consultant. In general, the consultant encourages the provision of facilities necessary for an adequate and complete educational program; recommends facilities planning in accordance with sound practices and procedures; recognizes accepted administrative policies and procedures; and provides specialized knowledge of school buildings.

Suggested areas of responsibility with detailed activities included under each are:

1. *School plant surveys and procedures*
 - a. Coordinates all phases of the survey
 - b. Conducts the survey in person
 - c. Advises all survey participants as to techniques
 - d. Selects specialized techniques to fit specific situations
 - 1) Analyzing educational program
 - 2) Forecasting enrollments
 - 3) Estimating building capacities and utilization
 - 4) Evaluating financial ability and effort
 - e. Formulates recommendations in accordance with sound practices and procedures
 - f. Interprets survey to the superintendent, board of education, and to the public
2. *Functional planning and facilities design*
 - a. Develops procedures for planning
 - b. Serves as liaison between planning committees or groups and the school administration
 - c. Submits periodic progress reports to administration
 - d. Determines what the educational program requirements and philosophy of the locality are
 - e. Knows the rules, regulations, codes, and board policies
 - f. Determines space, facility, and service needs
 - g. Recommends furniture and equipment most suitable for each program
3. *Development of educational specifications*

Prepares a written description of the educational program to be housed, based on the philosophy, aims, and objectives of the locality. This includes:

 - a. Regular and special course offerings
 - b. Space requirements and relationships
 - c. Auxiliary services to be provided
 - d. Teaching staff and methods
 - e. Numbers of pupils to be served
 - f. Special needs
4. *Public relations programs*
 - a. Interprets the immediate and long-range program and building needs to the public
 - b. Provides periodic press releases during the building planning program
 - c. Arranges publicity during bond campaigns
 - d. Prepares for the dedication of the completed building and orientation of the staff and public
5. *Site selection, development, and utilization*
 - a. Sets up criteria for site selection, layouts, and development

- b. Makes spot maps of pupil residences
- c. Advises on legal aspects of acquiring land
- 6. *Capital outlay and financing programs*
 - a. Recommends methods of financing the construction program
 - b. Determines the sources of construction funds at the local, state, and national levels
 - c. Plans bond campaigns
- 7. *Financial management of the construction budget*
 - a. Prepares construction budget
 - b. Establishes business procedures and methods of accounting for funds
 - c. Authorizes payments to contractors periodically
 - d. Institutes financial safeguards
- 8. *Study of building costs and economies*
 - a. Establishes criteria and variables for estimating construction costs
 - b. Determines economies of planning
- 9. *Contractual procedures*
 - a. Determines legal requirements for approval of plans, letting of bids, and awarding of contracts
 - b. Aids in the selection of the architect and establishes working relationships with him, contractors and others
 - c. Helps to determine qualifications of bidders
 - d. Recommends awarding of contracts
- 10. *Building construction program*
 - a. Supervises construction (clerk of the works)
 - b. Controls change orders in final plans
- 11. *Furniture and equipment selection and purchasing*
 - a. Sets up criteria for selection of furniture and equipment
 - b. Specifies and advertises for bids for purchase
 - c. Adapts policies and programs of repair and replacement of furniture and equipment
- 12. *School plant management*
 - a. Arranges for plant maintenance and operation
 - b. Sets up custodial schedules and staffing
 - c. Conducts in-service training programs for custodial and maintenance staffs
 - d. Adapts school protection and safety practices
 - e. Arranges insurance programs and schedules

This wide and diversified range of responsibilities required of the educational building consultant implies that certain types of formal training and experience are essential to equip him to better do the job he is doing or will be doing. Therefore, a survey of school plant courses offered at the graduate level was conducted by the Office of Education. Originally, the intent of the survey was to bring Ray Hamon's study on *School Plant Courses* up to date. There were, however, so many inquiries from the

cooperating colleges and universities about course content, sequence, qualifications, training, and competencies needed by educational plant specialists, that the study was broadened.

An inquiry was sent to 390 graduate schools, colleges or departments of education requesting the following information:

1. The title and catalogue description of the course;
2. The number of times the course has been or will be offered;
3. The major topic areas included in the course.

Of these 390 institutions, 186 indicated that some 233 separate school plant courses were offered during the regular years and summer terms inclusive, either on a quarter or semester basis. There was an average of 97 different school plant courses offered during each of the summer terms between 1959 and 1964, and an average of 140 each year during the academic years 1959-1963.

Major topic areas included in the courses and the frequency with which they were covered were:

a. Philosophy of school building planning	150
b. School building surveys	147
c. Planning functional facilities	155
d. Developing educational specifications	157
e. Functions and responsibilities of board of education, superintendent, architect, educational consultant, and others in the building program	158
f. Administering the school construction program	125
g. Building costs and economies	147
h. Financing the school building program (capital outlay)	134
i. Maintenance and operation	122
j. Furniture and equipment	129
k. School site, selection, and utilization	160
l. School building design problems	126

Can and do these school plant courses provide all of the competencies needed by the educational plant specialist? I am sure that the panel members will shed some light on this question. Without further introduction, then, I should like to call upon Les, Harold, Dave, and Darwin in that order.

ROLE AND TRAINING

LESTER J. WELCH

The suburbs of Washington, D.C. where I am located were described only last week as the fastest growing suburban area in the United States. There are four counties that surround the District of Columbia—two in Maryland, and two in Virginia. One of the counties, Arlington, Virginia, is small and is growing up. The other three sprawling counties are Fairfax, Virginia; Prince George County; and Montgomery County, Maryland. I am from Montgomery County. Between these three areas we opened 1,100 new classrooms this fall. This represents some thirty-five new schools and took care of an estimated enrollment increase of 30,000 pupils. That sounds like Los Angeles.

I will tell you briefly about the areas of responsibility for the school plant specialist in these counties. If you can tell me why so many people move to Washington, D.C. and give me the formula by which they move, I think our demographic work could be much more precise. Only now our staff members are predicting enrollments for next fall. But, if on November 6 the administration changes, we could throw it all out the window. The public school enrollment in my county in the last sixteen years has moved from 20,000 pupils to 106,000. This is typical of the other two areas that surround Washington. This ever-changing pattern and the great number of projects which we carry on spell out the areas in which we work.

We must learn to be able to program new schools very quickly; particularly in those areas where unanticipated growth has happened or that happened far more quickly than we thought. In our work with the architects, whether it be at the preliminary design stage or the working, drawing stage, we must have many answers at our fingertips. We have a responsibility and we must make decisions and we cannot procrastinate. Can you teach that in college, Bill?

We must have the capability of visualizing in a manner not too dissimilar from the architects. With the rapid movement from one project to another we must have the capability of disassociating ourselves from one project and attacking another with an objective viewpoint or approach, mindful of the very great variations that exist between architects, contractors, supply persons, etc. We must have a very good capability of taking groups along with us. This is particularly true in large jurisdictions—you take them along either because you want them to help you or because you want to develop in them a better understanding.

We must have an uncommonly good sense of school design solution, not to build cheap schools, but to build economical schools. You say this won't happen to you? I say you had better be alerted to this need.

Montgomery County, Maryland, in which I work is classified as the county with the highest per capita income in the United States. Yet our watchword is economy. Two years ago in this very wealthy county we had four members representing the majority of our board elected on an economy platform. Some of the very mundane things that they talked about publicly were the use of glazed tile in schools, which is, according to all of you, an economical approach to construction because it saves future maintenance costs. They talked about such things as aesthetics at no extra cost. How can architects provide that?

I would like to talk a little more in detail about one problem that is bothering me and as I have talked to members of this organization, I know it is bothering you, too. As our area grows, we establish new schools and locate them very carefully, according to a formula or a calculation on pupils, etc. which we think we know all about. We very carefully program the school for its ultimate size and before long the size is exceeded. And that is not all of it, because all of the land is now gone. It is not possible to locate another school. There is no choice but to go back and make an addition to the original school. Sometimes we go so far as to go back to the board of education and ask them to change their standard on what they think the optimum size of the school should be. I recall in 1946-48 we used the old FHA formula of 6/10 elementary school pupils per home. 3.8 was the calculated family size. We planned several schools with an ultimate size of eighteen rooms during that next decade. Most of those schools now have thirty classrooms. As recently as five or six years ago we planned some schools with an ultimate size of twenty-four classrooms. We thought that was a good optimum size and at least two of those schools now have thirty-two classrooms. We are caught in a dilemma—what is the ultimate size of the school and couldn't we plan it at the outset? No, because a subdivider comes in and builds four-, five- and six-bedroom homes instead of the three we thought that he was originally going to have.

We are seeing considerable apartment construction along with this, particularly in the suburban areas where you would least expect it. Just yesterday Glenn Fletcher and one of his associates said, "I don't know why they build these high-rise way out in the outskirts." They tend to lower the pupil yield per unit but there is a much higher pupil per acre basis. Schools in these areas get very large unless we can anticipate all of the growth that is going to take place and all of the possibilities that relate to it, including any possible future zoning changes.

A corollary of this apartment construction which few of us think about but which is of very great concern to us, is that as the apartments

are occupied they tend to drain off from the areas of homes whose families have no children, thereby again raising the yield of the homes and making our existing schools that much larger. Our planning division of five men has done a considerable amount of planning as it relates to ultimate school size. They have taken a particular area of our county which is subject to zoning changes (I have here a map that illustrates the number of schools in this), described boundaries of the existing seven schools, the several sites that we are going to build on and other areas where we still have to buy sites. Each of these areas was studied as to its present yield of pupils, its estimated ultimate yield, zoning conditions and what we can expect for the ultimate school in that area. Our board was very pleased with this approach and they have asked us to do several others.

I would like to tell Bill what he should include or recommend to have included in college courses, but I couldn't. Some of the areas which I talked about can't be taught in school. But, what our schools could do is get the people out in the field so that they can learn the problems which we workers have to deal with. This is being done in some of our colleges. I had talked to the fellows from Ohio, Stanford, Tennessee, and so on, and they are getting the pupils out into the school and experiencing the problems.

But a significant step that follows this is to then develop in these students and school planners or school plant specialists a sensitivity to these needs that I have mentioned.

ROLE AND TRAINING

HAROLD W. BOLES

I would like to ask before I talk briefly on these points how many people there are here who teach one or more courses in school plant planning? May I see your hands please? Thank you. I just wanted to be assured of some support because after some of the remarks I heard on one of the tour buses yesterday afternoon about professors and about theory I wasn't sure that I dared talk about theory this morning.

I would like to make three points. I believe that what we have been doing in most of our university courses is wrong. We have generally taken a man in general school administration, given him one-, two- or three-hour courses in school plant planning and construction, and thrown a lot of literature at him—and then expected him to be an expert in all phases of school plant planning and construction. To me this is the same as handing a person a full box of recipes and expecting him to be a good nutritionist.

The second point I would like to make is that this is impossible because we have so many different things that we try to do in a limited time available in university courses. As I teach a school plant course I try to analyze the planning and construction as a series of twelve steps; and really, a man could be a specialist in any one of these twelve areas and could spend all of his time learning about one particular step.

First of all, getting organized. A man would have to be a good administrator and organizer just to organize a school plant development program. Secondly, studying curriculum. He needs to be a curriculum specialist or to have a curriculum specialist available. I heartily concur that we must plan around the program and that the staff and pupils are even more important than the program. Thirdly, the building needs survey. We expect a man to be a specialist in doing surveys. Educational planning and development of educational specifications for each specific project is a field in itself and a man could well be a specialist in this area alone. As for the matter of site acquisitions, setting up criteria, negotiating for site, checking to make sure that the title is clear—all of this requires specialization, architectural planning, and having school people understand the clear demarcation of the responsibility.

What is their responsibility? Understanding what the architect is trying to do requires specialization. I know one superintendent who had become an investment specialist. They have had so many bond issues that he has spent most of his time investing bond issues proceeds and is considered a specialist in this area and has done very well. The matter of contracting—the contracting procedure itself is becoming so involved that this almost requires specialization. The problems of construction while the building is actually going up—a further step requiring specialization. The equipping and furnishing—and we said that school people should understand this and be responsible for it. And the one that I find overlooked in nearly every new building and we have experienced the same thing on our campus in occupying a new education building this fall—is that the people who use the building are not instructed for use of the building. This I see is a particular step which is generally omitted, but one where we could very well have a master teacher instructing the people who are to use the plant. Orientation I see as a larger step starting with the need for facilities and continuing throughout the instruction. If we

take the specifics for which any building should be planned—the welfare of the occupants; the functionality; the provisions for future use, and I think this is something more than flexibility; the provisions for aesthetics or beauty; provisions for economy—a man could well spend a lifetime becoming a specialist in any one of these areas.

Now as you are all aware, there is a generous amount of literature so that a man could well become a specialist in any of the elements of school buildings, whether it is elementary, secondary, or higher education. He might very well become a specialist in kindergarten building or in planning elementary libraries, etc. It seems to me that because of the number of areas, what we have been attempting to do is impossible.

The third major point that I would like to make is that I do think there is something that we can do realistically in a two- or three-hour college course. I don't think we can give the understandings of all the areas that I have mentioned nor do I believe that we can make a man a specialist in all of these areas or even in one of them in that length of time. I do think that we can teach a person in a two- or three-hour university course a cohesive theory of school plant planning and development. We have not had one in most of the textbooks, but I think it is possible. We can help him understand how to marshal, organize, and utilize the human resources that are available in any school district and that must be used if we get good planning and construction. I think—and this requires getting out into the field as Mr. Welch mentioned—that we can help the individual understand the responsibilities of each of the members of the planning team and the contributions to be made by each member of the team. We can help him understand the enormity and dimensions of the planning construction task. We can direct his attention to sources of further information. This is about the extent of what I believe we can do in a two- or three-hour university course.

ROLE AND TRAINING

DAVID W. HUTCHESON

I have been in the state department job with school plant services for two years. I have had the feeling that it is an impossible task sometimes. Dr. Chase asked me to speak through my own experience. My experience has been different only to the extent that I have had the one or two courses in literature thrown at me; but I have had a close relationship with the University of Nebraska and Dr. Stoneman, so that when these questions arise he doesn't leave me out on a limb: I can turn to the resources of the university. We work cooperatively on almost all phases. We do limit services somewhat. We are not as extensive in our services as was indicated by the previous speaker.

A second point is that not experience alone brings about the competencies for this job; but it must be planned so that the competencies are identified and brought about by experiences so designed. I have also had help with the office of education. John Cameron just called in the people who are new in the various state departments of education providing services—I found this workshop to be most helpful. The Council itself, I attended three meetings and the associations that I have had have been helpful; the literature that has been provided I found to be most helpful. We are now seeking in our department another person to work in the section in which I work now. We are having difficulty finding someone who has the background and experience that is called for, partly because of salary, but partly because of the lack of people trained in this area. What we plan to do at the present time is to put a graduate student in to work in cooperation with the University of Nebraska. I think this will work out in our situation.

ROLE AND TRAINING

DARWIN W. WOMACK

I think it has been agreed and I concur and strongly think, Bill, that our job is complex, but I mildly object to this word *specialist*. I think it is impossible for one man to know and to keep up with all the knowledge necessary for good plant planning. Consequently, I think the school plant planner really is a leader of a team and this team is large. His chief responsibility is perhaps to identify, or to help identify the problems and then through all kinds of ways to help find the people who can offer some possible solutions. I will list for you some of the main resources that we in Atlanta ask to help with our problems. I submit that these have implications for the training institutions.

I was glad to hear Jim mention that strong emphasis should be given in sources of help that the school plant planner should utilize. Obviously, within his own staff, the school plant planner needs someone from the architectural and engineering profession and we have that in Atlanta. These people are, I think, entirely necessary. I am sure there will be interested private architects and engineers who can be of assistance. We use those people too. Also, you need somebody on the staff who can do enrollment projections.

The school plant planner must work closely with the director of purchasing, with the bidding procedure, selection and purchasing of equipment and furniture, etc. We have a director of maintenance and operations who looks after those kinds of problems.

In the same division we have directors of cafeterias. On this staff there are people who are specialists in equipment and layouts of the functions of a cafeteria.

Then, in my own small department time is spent on problems of land, land acquisition, appraisals, options, and this kind of thing.

On the staff you need legal services; we have a board attorney who does many things for us and we are in daily contact with him. And of course we work closely with the comptroller in budgeting and settling arguments about whether or not this item or that item can be paid out of what account. You have all gone through that.

I suppose the most important group on my own staff is the large core of people in instruction from the assistant superintendent, director of

supervisors, coordinators, to the teachers. It is these people that we rely upon to state the program to my department. We rely upon them to help write the educational specifications. This is the full range of the instructional program I am talking about including vocational, industrial arts, military, audio-visual aids, libraries. We turn readily to the area superintendent—Atlanta being divided into five school areas—who is familiar with problems in his own area, and, of course, we work closely with principals.

Obviously, we have to work closely with the superintendents, the buildings and grounds committees and the board of education and are involved in all types of discussions and reports and preparing board agenda items and so forth.

There is another gentleman with the Atlanta and Fulton Counties School Systems called the coordinator of the Metropolitan School Development Council. His job is to work himself out of a job by merging Atlanta and Fulton Counties. We are beginning to look ahead toward a merger and we need to get our school facilities in line as quickly as possible. One small problem is that Atlanta has a kindergarten program and Fulton County does not. Every time we take over a Fulton County school we have to somehow carve out a facility for a kindergarten program.

The school plant planner not only is involved with the school, and every department in the school, but practically every department of the state and city and county governments. Some of the state people whom we use as consultants are members of the school plant services department, health department, fire marshal's office, school building authority, under whom we build some of the buildings, the department of vocational education, and the employment service. Under the city and county we are in almost constant contact with the city planning commission, the parks and recreation department, the city zoning committee, urban renewal people. They occasionally call us up and say, "We are going to put up about 650 apartments over here in such and such an area. What are your plans for a school?" Also, we work with the Atlanta Housing Authority, our city public library system, the construction department, sewer, sidewalk, traffic, the transit company, building inspectors, city fire marshal, the county highway department, and the county health department.

I think the school plant planner mustn't stop with these official bodies. There are consultants within the area that he should use. We meet quite often with the representatives of the utilities companies. We are in constant touch with other architects and engineers, some of whom serve on advisory committees with us and actually help in preparing these aspects of educational specifications. We tap artists, and even use salesmen to help with some of our planning problems. There are certain community redevelopment groups in Atlanta, private organizations that are trying

to maintain the integrity of their community, upgrade it and change the course of things happening around them. We are in touch with them and meet with them often. We have several committees representing business, industries and trades helping us with our efforts to upgrade our industrial and vocational arts program. But I suppose the greatest help to us at Atlanta have been consultants who are considered outsiders. These people can readily be called specialists and are recognized in Atlanta as such.

The group we rely on is the School Planning Laboratory at the University of Tennessee. We have an annual contract with this group, and we use them in a variety of ways. The way they like to work is to come in and take a faculty and build for a school; but we are building quite rapidly, as you are, and it is quite impossible to do this. Here are some of the things I thought I would list as having helped us most. We got them on a large project—a \$6 million vocational technical school. This was our initial contract with them and they helped us organize and study and write the educational specifications for this school. You will find a brief write-up of the educational aspects of it in the recent issue of the *American School and University*.

We also were confronted with passing a bond issue and getting twenty-two architectural firms busy at the same time on our building program. We could see days and days and weeks and weeks of meeting with them individually, so we presented this problem to the University School Planning Laboratory and they suggested doing it on a team teaching basis, by having a conference and getting people in from across the country and talking about new concepts. We organized this conference for the architectural firms commissioned by our board and it is still talked about today as being highly successful. These people can bring to Atlanta their most qualified and highly trained people and we are proud to have them working with us. I think it has meant a great deal. We get them on a specific school problem, we tour the building which must be either renovated or demolished. We have had a particular site problem they helped us with. (They also, and this was quite enjoyable, arranged a tour to Greeley, Colorado and Hunter, Colorado, as well as schools in Kansas.) It was a fine experience and provided us with a great deal of literature and research. The next week they sent a food specialist consultant down for us to consider problems of food service in our technical schools. I suppose the best help these people provide is what they do for me and the others on the staff and for the professional people in the city—bringing new thoughts and ideas.

I believe fully that the education facilities planner should be educated as a teacher-administrator with major emphasis on school plant planning, and certainly this can't be done in one, two, or three courses. I think the thing that has helped me most is my experience with the School Planning Laboratory at the University of Tennessee, working with

them for over a year, going out to school systems across Tennessee and other states and actually sitting down with faculties and administrators and getting practical experience in writing educational specifications. Gentlemen, I think this is the key to better school plant planning and I think it ought to be seriously considered in organizing these kinds of programs.

WILLIAM CHASE

I would like to close our discussion by posing several questions for future consideration:

1. What action should we take to further professionalize the position of the educational building consultant?
2. Should certification or licensing programs such as there are for assistant principals teachers, supervisors, and others be established for the school building consultant?
3. Should guidelines for the selection of an educational building consultant be formulated for use by boards of education?
4. Should the National Council provide or endorse inservice training programs for building consultants in addition to the regional and national conferences which you already have?
5. Should there be sectional or regional training centers set up and certified for the specific purpose of training educational plant planning consultants?